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FIG. 1

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1	n-TYPE GaN EMITTER LAYER (Si:5×10^{19}cm^{-3},40nm)
2	p-TYPE InGaN BASE LAYER (In:7%,Mg:1×10^{19}cm^{-3},100nm)
3	GRADED InGaN LAYER(30nm)
4	n-TYPE GaN COLLECTOR LAYER (Si:1×10^{17}cm^{-3},500nm)
5	n-TYPE GaN SUB-COLLECTOR LAYER (1μm)
6	AlN BUFFER LAYER(100nm)
7	SiC SUBSTRATE

FIG. 2

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FIG. 3

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FIG. 4

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FIG. 5

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COLLECTOR-EMITTER VOLTAGE (V)

PRIOR ART

FIG. 6

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FIG. 7

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FIG. 8

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FIG.9A PRIOR ART

CRYSTAL GROWTH OF
HBT STRUCTURE

21:n-TYPE GaN EMITTER LAYER
22:p-TYPE InGaN BASE LAYER
23:n-TYPE COLLECTOR LAYER
24:n-TYPE SUB-COLLECTOR LAYER
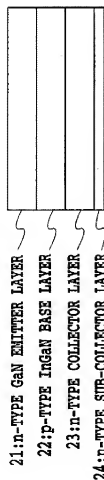
FIG.9B PRIOR ART

SURFACE EXPOSURE OF
BASE LAYER BY ETCHING

21:n-TYPE GaN EMITTER LAYER
22:p-TYPE InGaN BASE LAYER
23:n-TYPE COLLECTOR LAYER
24:n-TYPE SUB-COLLECTOR LAYER
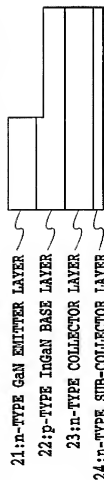
FIG.9C PRIOR ART

SURFACE EXPOSURE OF
SUB-COLLECTOR LAYER BY ETCHING

21:n-TYPE GaN EMITTER LAYER
22:p-TYPE InGaN BASE LAYER
23:n-TYPE COLLECTOR LAYER
24:n-TYPE SUB-COLLECTOR LAYER
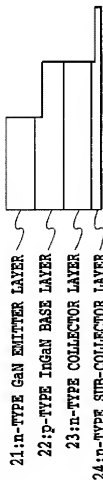
FIG.9D PRIOR ART

FORMATION OF p-TYPE
ELECTRODE ON BASE LAYER

25:p-TYPE ELECTRODE
21:n-TYPE GaN EMITTER LAYER
22:p-TYPE InGaN BASE LAYER
23:n-TYPE COLLECTOR LAYER
24:n-TYPE SUB-COLLECTOR LAYER
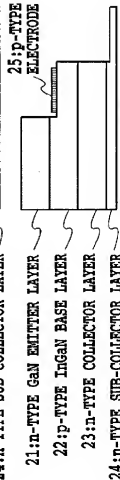
FIG.9E PRIOR ART

FORMATION OF n-TYPE ELECTRODES
ON EMITTER LAYER AND
SUB-COLLECTOR LAYER

26:n-TYPE ELECTRODE
25:p-TYPE ELECTRODE
26:n-TYPE ELECTRODE
21:n-TYPE GaN EMITTER LAYER
22:p-TYPE InGaN BASE LAYER
23:n-TYPE COLLECTOR LAYER
24:n-TYPE SUB-COLLECTOR LAYER

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31 — n-TYPE AlGaN EMITTER LAYER
32 — p-TYPE GaN BASE LAYER
33 — n-TYPE GaN COLLECTOR LAYER
34 — n-TYPE GaN SUB-COLLECTOR LAYER
35, 36, 37, 38

FIG. 10